



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/682,899	10/31/2001	Melvin Robert Jackson	RD-27885	2924

6147 7590 11/18/2003

GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH CENTER
PATENT DOCKET RM. 4A59
PO BOX 8, BLDG. K-1 ROSS
NISKAYUNA, NY 12309

EXAMINER

MCALLENAN, JAMES M

ART UNIT	PAPER NUMBER
----------	--------------

3745

DATE MAILED: 11/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/682,899

Applicant(s)

JACKSON ET AL.

Examiner

James M McAleenan

Art Unit

3745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Applicant's Amendment A, paper no. 8.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1,3,4,6-8,10,11,28,30-33,35-37,39,40,42-44,46,47,64-69,71-73,102-117 and 133-140 is/are rejected.
- 7) ☐ Claim(s) 13-20,29,49-51,54-56,79,98,101 and 118-132 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

Continuation of Disposition of Claims: Claims pending in the application are 1,3-4,6-8,10-11,13-15,17-20,28-33,35-37,39-40,42-44,46-47,49-51,54,-56,64-,69,71-73,79,98,101-140.

Art Unit: 3745

Response to Arguments

1. Applicant's response dated 8/18/2003 is acknowledged.
2. Applicant's arguments filed 8/18/2003 have been fully considered but they are not persuasive. Examiner cited Jackson et al. (U.S. Patent Number 5,820,337) in view of Punola et al. (U.S. Patent Number 5,264,245) as meeting Applicant's claimed invention in examiner's first action of the prior art section. Note Examiner cited on page 3 of the First Office Action references Moore (U.S. Patent Number 5,702,232) and LaFleur (U.S. Patent Number 6,254,334) as Prior Art relevant to Applicant's claimed invention.

Applicant argues that the modified Jackson et al. reference does not have impact cooling bores formed between the elevations of the airfoil. Examiner would like to point out page 2, first paragraph of the examiner's First Action, wherein the Applicant failed to respond to the examiner's 35 U.S.C. 112, second paragraph rejection of claims 12-33.

3. The Examiner respectfully disagrees with the Applicant's argument stated (see page 3, second full paragraph) in Amendment A (paper no. 8). While applicant may be his or her own lexicographer, the term "tip insert" in the claims has been defined in the Specification (and again in Applicant's Amendment A (paper no. 8)):

"A freestanding article suitable...to be used as a blade tip or portion of a blade tip upon being disposed onto the blade body." (see page 3, second full paragraph).

Art Unit: 3745

Examiner made the argument in the first Office action (paper no. 7) stating Applicant's claims do not overcome the presented prior art, since the definition of "tip insert" (as understood from Applicant's definition in the Specification) can also be understood to be material disposed onto the blade body for repair (see Arnold U.S. Pat. No. 6,049,978, or Ferrigno et al. U.S. Pat. No. 5,846,057, or James et al. U.S. Pat. No. 6,491,208). Applicant restates the definition of the "tip insert" (repeating Examiner's argument again) ... **"portion of a blade tip upon being disposed onto the blade body"**, in Applicant's Amendment A (paper no. 8). Clearly, the Examiner argument has not been overcome by Applicant's Amendment A (paper no. 8), thus this action is made FINAL.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 12-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant fails to provide any functional relationship with the coating comprising a taggant and the exhaust gas, or exhaust gas collector, or exhaust particle separator, or the particles separated from the exhaust gas. Applicant merely states that the claimed apparatus includes the above mentioned elements, but having no functional relationship with any one element?

Art Unit: 3745

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 12-19, 22-26 and 29-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zombo et al. (U.S. Patent Number 6,062,811) in view of Twerdochlib (U.S. Patent Number 5,865,598). Zombo et al. teaches a gas turbine including parts having a coating with a taggant. See Col. 5, lines 9-18 of Zombo et al. Zombo et al. discloses a exhaust gas collector or sniffer (see Col. 5, lines 30-42) in fluid communication with the gas turbine parts, whereby the collector samples a portion of an exhaust gas which passed over the coated gas turbine parts. See Figure 3, Col. 5, lines 30-42 of Zombo et al. Zombo et al. teaches an exhaust particle separator connected to a gas exhaust collector, whereby the separator separates particles from the exhaust gas. See Col. 5, lines 44-53 of Zombo et al. Regarding claim 14, Zombo et al. teaches the gas turbine part being an airfoil. See Col. 3, line 60 of Zombo et al. Regarding claim 16, Zombo et al. teaches the coating including multiple layers. See Col. 5, lines 8-45 of Zombo et al. Regarding claim 17, Zombo et al. discloses the taggant being incorporated at one or more layer interfaces of the coating. See Col. 5, lines 8-45 of Zombo et al. Regarding claim 18, Zombo et al. teaches the taggant being incorporated in one or more layers of the coating. See Col. 5, lines 8-45 of Zombo et al. Regarding claim 19, Zombo et al. discloses each of the layers

Art Unit: 3745

independently having a different taggant. See Col. 5, lines 8-45 of Zombo et al. Regarding claim 22, Zombo et al. teaches the layers including a thermal barrier coat (TBC) and a bond coat. Regarding claim 24, Zombo et al. teaches an analyzer connected to the separator, wherein the analyzer is capable of detecting the taggant. See Col. 5 8-55 of Zombo et al. Regarding claim 26, Zombo et al. teaches a particle concentrator connected to the separator. Regarding claim 30, Zombo et al. discloses a turbine component substrate, as well as a bond coat provided on the turbine component substrate. Regarding claim 31, Zombo et al. teaches a gas turbine parts being provided with a coating having a taggant. Zombo et al. discloses a collector means for sampling a portion of the exhaust gas which passed over the coated gas turbine parts. Zombo et al. teaches a separator means for separating particles from the exhaust gas. Regarding claim 32, Zombo et al. discloses an analyzer means for detecting the presence of the taggant in the particles and a concentrator means for concentrating the particles.

However, Regarding claim 13, Zombo et al. does not disclose a storage compartment connected to the separator, whereby particles separated by the separator are stored. Regarding claim 15, Zombo et al. does not teach the taggant being selected from the group consisting of Sr, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Re, Ru, Pd, Pt, and Au. Regarding claim 23, Zombo et al. does not disclose the TBC or a TBC interface including a taggant selected from the group consisting of Sr, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu. Zombo et al. does not teach the bond coating or a bond coat interface comprising a taggant selected from the group consisting of Sr, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Re, Ru, Pd, Pt, and Au. Zombo et al. does not disclose the TBC or a TBC interface taggant

Art Unit: 3745

being different from the bond coat or bond coat interface taggant. Regarding claim 25, Zombo et al. does not teach the analyzer being a mass spectrometer. Regarding claim 30, Zombo et al. does not disclose a Thermal barrier coat (TBC) applied over the bond coat. Regarding claim 33, Zombo et al. does not teach the elements selected from the group consisting of La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Re, Ru, Pd, Pt, and Au being present exclusively as taggants so that their collection pinpoints where damage may occur.

However, Twerdochlib (U.S. Patent Number 5,865,598) discloses a storage compartment connected to the separator, whereby particles separated by the separator are stored. See Col. 5, lines 8-19 of Twerdochlib. Regarding claim 15, Twerdochlib discloses the taggant being selected from the group consisting of Sr, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Re, Ru, Pd, Pt, and Au. See Col. 2, lines 19-22; Col. 4, lines 1-29 of Twerdochlib. Regarding claim 23, Twerdochlib discloses the TBC or a TBC interface including a taggant selected from the group consisting of Sr, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu. See Col. 2, lines 19-22; Col. 4, lines 1-29 of Twerdochlib. Twerdochlib teaches the bond coating or a bond coat interface comprising a taggant selected from the group consisting of Sr, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Re, Ru, Pd, Pt, and Au. See Col. 2, lines 19-22; Col. 4, lines 1-29 of Twerdochlib. Twerdochlib discloses the TBC or a TBC interface taggant is different from the bond coat or bond coat interface taggant. Regarding claim 25, discloses the analyzer being a mass spectrometer. See Col. 5, lines 8-19 of Twerdochlib. See Col. 5, lines 8-19 of Twerdochlib. Regarding claim 30, Zombo et al. does not disclose a

Art Unit: 3745

Thermal barrier coat (TBC) applied over the bond coat. Regarding claim 33, Twerdochlib teaches the elements selected from the group consisting of La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Re, Ru, Pd, Pt, and Au being present exclusively as taggants so that their collection pinpoints where damage may occur. It would have been obvious to one having ordinary skill in the art, at the time applicant's invention was made, to modify the Zombo et al. detection system elements and materials with the detection system elements and materials as taught by Twerdochlib, for the purpose of providing a storage compartment connected to the separator, whereby particles separated by the separator are stored and tested to determine where possible damage may have occurred as claimed by Applicant's claimed invention.

6. Claims 20 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zombo et al. (U.S. Patent Number 6,062,811) in view of Twerdochlib (U.S. Patent Number 5,865,598)) in further view of either Sechrist et al. (Pub. No. U.S. 2002/0144931 A1), or Hiltunen (Pub. No. U.S. 2002/0033098 A1). The above modified Zombo et al. device discloses in the rejection of claim 12 above, all the claimed elements, except the modified Zombo et al. device does not disclose claim 20, such that the separator is a cyclone separator. Regarding claim 27, the modified Zombo et al. device does not disclose the exhaust gas collector including tubes, wherein the separator is a cyclone separator.

However, Sechrist et al. (Pub. No. U.S. 2002/0144931 A1) or Hiltunen (Pub. No. U.S. 2002/0033098 A1) disclose the exhaust gas collector having tubes, wherein the separator is a cyclone separator. It would have been obvious to one having ordinary skill in the art, at the time

Art Unit: 3745

applicant's invention was made, to modify the Zombo et al. separator with the cyclone separator as taught by Sechrist et al. or Hiltunen, for the purpose of separating the particulates from the gas by means of centrifugal force as claimed by Applicant's claimed invention.

7. Claims 21 and 28 rejected under 35 U.S.C. 103(a) as being unpatentable over Zombo et al. (U.S. Patent Number 6,062,811) in view of Twerdochlib (U.S. Patent Number 5,865,598)) in further view of Wright (U.S. Patent Number 5,261,931). The above modified Zombo et al. device discloses in the rejection of claim 12 above, all the claimed elements, except the modified Zombo et al. device does not disclose claim 21 wherein the separator is an electrostatic precipitator. Regarding claim 28, the modified Zombo et al. device does not teach the exhaust gas collector has an annular ring having one slot, wherein the separator is an electrostatic precipitator having a high voltage wire.

However, Wright (U.S. Patent Number 5,261,931) discloses the separator is an electrostatic precipitator. Wright teaches the exhaust gas collector has an annular ring having one slot, wherein the separator is an electrostatic precipitator having a high voltage wire. It would have been obvious to one having ordinary skill in the art, at the time applicant's invention was made, to modify the Zombo et al. separator with the electrostatic precipitator as taught by Wright, for the purpose of removing particulate matter to provide a cleaner stack effluent as claimed by Applicant's claimed invention.

Art Unit: 3745

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-11, 29, 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Twerdochlib (U.S. Patent Number 5,865,598) in view of Zombo et al. (U.S. Patent Number 6,062,811). Twerdochlib discloses an on-line method of assessing wear and/or damages to gas turbine parts, wherein the method provides for gas turbine parts having a coating with a taggant. See Col. 2, lines 12-38 of Twerdochlib. Twerdochlib teaches the method of collecting particles of an exhaust gas stream which passed over the above part that provides a particulate containing fraction. See Col. 6, line 31 of Twerdochlib. Twerdochlib discloses analyzing the particulate containing fraction of the taggant, whereby the presence of the which indicates wear or damage to the gas turbine part. See Col. 2, lines 12-38 of Twerdochlib. Regarding claim 2, Twerdochlib teaches the gas turbine part that is an airfoil. See Col. 3, line 24 of Twerdochlib. Regarding claim 3, Twerdochlib discloses the taggant being selected from the group consisting of Sr, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Re, Ru, Pd, Pt, and Au. See Col. 2, lines 19-22; Col. 4, lines 1-29 of Twerdochlib. Regarding claim 10, Twerdochlib teaches the concentrating particles in the particulate containing fraction before analyzing the particles for the taggant. Regarding claim 11, Twerdochlib discloses the TBC or a TBC interface comprising a

Art Unit: 3745

taggant selected from the group consisting of Sr, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu. See Col. 2, lines 19-22; Col. 4, lines 1-29 of Twerdochlib. Twerdochlib teaches the bond coating or a bond coat interface comprising a taggant selected from the group consisting of Sr, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Re, Ru, Pd, Pt, and Au. See Col. 2, lines 19-22; Col. 4, lines 1-29 of Twerdochlib. Twerdochlib discloses the TBC or a TBC interface taggant is different from the bond coat or bond coat interface taggant.

Regarding claim 29, Twerdochlib discloses a turbine component substrate and an environmental resistant coating applied on the turbine component substrate. Twerdochlib teaches the environmental coating or a coating/substrate interface comprises of a taggant selected from the group consisting of Sr, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Re, Ru, Pd, Pt, and Au. Regarding claim 30, Twerdochlib discloses a turbine component substrate and a bond coat provided on the turbine component substrate. Twerdochlib teaches a thermal barrier coat (TBC) applied over the bond coat, wherein the TBC or a TBC interface comprises of a taggant selected from the group consisting of Sr, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu. Twerdochlib discloses a bond coat or a bond coat interface comprising of a taggant selected from the group consisting of La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Re, Ru, Pd, Pt, and Au. Twerdochlib teaches the TBC or TBC interface taggant being different from the bond coat interface taggant. However, Twerdochlib does not teach the coating comprises of multiple layers. Regarding claim 5, Twerdochlib does not the taggant being incorporated in one or more layer interfaces of the coating. Regarding claim 6, Twerdochlib does not teach the taggant in one or more layers of the coating. Regarding claim 7, Twerdochlib does

Art Unit: 3745

not disclose each of the layers independently comprise of a different taggant. Regarding claim 8, Twerdochlib does not teach the layers comprise of a thermal barrier coat (TBC) and a bond coat. Regarding claim 9, Twerdochlib does not disclose each interface containing a different taggant.

However, Zombo et al. (U.S. Patent Number 6,062,811) discloses the coating comprising of multiple layers. Regarding claim 5, Zombo et al. discloses the taggant being incorporated in one or more layer interfaces of the coating. Regarding claim 6, Zombo et al. teaches the taggant in one or more layers of the coating. Regarding claim 7, Zombo et al. discloses each of the layers independently comprise of a different taggant. Regarding claim 8, Zombo et al. teaches the layers comprise of a thermal barrier coat (TBC) and a bond coat. Regarding claim 9, Zombo et al. discloses each interface containing a different taggant. It would have been obvious to one having ordinary skill in the art, at the time applicant's invention was made, to modify the Twerdochlib device for detecting critical temperatures or melting points with multiple layers of coatings wherein each coating has releasable taggants as taught by Zombo et al., for the purpose of providing a detection system with multiple activation temperatures for each individual coating as claimed by Applicant's claimed invention.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for response to this action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of

Art Unit: 3745

the mailing date of this final action and the advisory action is not mailed until after the end of the THREE MONTH shorten statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

CONTACT INFORMATION

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner James M. McAleenan whose telephone number is (703) 308-2827. The examiner can normally be reached on Monday thru Friday from 9:00 am to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Look, can be reached at (703) 308-1044. The fax number for this Group is (703) 305-3588.

An inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0861.



James M. McAleenan
Patent Examiner
Art Unit 3745

11/17/03



EDWARD K. LOOK
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700

11/17/03